Rehabilitation Guidelines for Conservative Management of Spinal Instability

These guidelines are intended to guide clinicians through the conservative course for spinal instability. These guidelines are time based (dependent on tissue healing) as well as criterion based. Specific interventions should be based on the needs of the individual and should consider exam findings and clinical decision making. The timeframes for expected outcomes contained within this guideline may vary based on physician preference, additional procedures performed, and/or complications. If a clinician requires assistance in the progression of a patient, they should consult with the referring provider.

The interventions included within these guidelines are not intended to be an inclusive list of exercises. Therapeutic interventions should be included and modified based on the progress of the patient and under the discretion of the clinician.

Considerations for the pars interarticularis stress fracture
Many different factors influence the spondylolysis/spondylolisthesis rehabilitation outcomes, including the grade of the defect/stress fracture. It is recommended that the clinician collaborates closely with the referring physician regarding progression through the phases of the program.

PHASE I: ACTIVE REST (0-6 WEEKS), 2-4 PT visits

Rehabilitation Goals	• Protect injured joint • Control pain/inflammation • Participate safely in activities of daily living • Address mobility/flexibility limitations • Promote hip and core muscle strength and stability • Maintain cardiovascular conditioning
Bracing/ Precautions	• Bracing may be recommended • Precautions*: avoid lumbar extension with activity, positioning, manual therapy, and exercise*

Interventions	*Education*
	• Patient education: posture, positioning, body mechanics, activity modification, *bracing*
	• If chronic, education should include pain neurophysiology, utilize FABQ, STarT back tool
	
	Pain Management
	• Modalities: heat/ice
	
	Mobility/Flexibility
	• Manual therapy
	  ○ Soft tissue mobilization: paraspinals, quadratus lumborum, gluteals, piriformis
	  ○ Hip/thoracic spine joint mobilizations
	• Thoracic spine
	  ○ Side-lying thoracic rotation with hips/knees at 90-90
	  ○ Supine thoracic extension with towel roll/foam roller
	  ○ Quadruped/modified plantigrade thoracic flexion/extension in neutral lumbar spine
	• Upper and lower extremity
	  ○ Standing stride doorway pectoral stretching
	  ○ Supine modified Thomas position hip flexor stretching
	  ○ Supine hamstring stretching
	  ○ Supine piriformis stretching

	Stability/Strength
	• Local core muscle control (Transverse Abdominis (TA)/Multifidus (MF)) in low load, spine-supported positions
	  ○ Hook-lying isometric TA contraction
	  ○ Hook-lying isometric TA contraction with heel slides
	  ○ Hook-lying isometric TA contraction with alternate UE elevation
	  ○ Side-lying isometric MF contraction
	  ○ Prone MF contraction
	• Hip strengthening
	  ○ Hook-lying gluteal sets
	  ○ Side-lying clam shell
	
	Cardio
	• Walking on treadmill
	• Stationary bicycle
	• Nu-Step machine

Criteria to Progress	• Pain/inflammation controlled • Full lumbar ROM (except extension) • Neutral spine posture with TA/MF contraction • Palpation/observation for lack of global muscle substitution with TA/MF contractions

PHASE II: EARLY STRENGTHENING (6-9 WEEKS), 4-6 PT visits

Rehabilitation Goals	• Monitor pain/inflammation • Address mobility/flexibility limitations • Improve trunk and hip muscle strength and endurance • Progress cardiovascular endurance
Bracing/ Precautions	• *Bracing* may be discontinued if no pain with ADL

Additional Interventions *Continue with Phase I Interventions*	*Stability/Strength*
	• Neutral trunk stabilization
	  ○ Hook-lying isometric TA contraction with march
	  ○ Supine dead bug
	  ○ Hooklying bridging with TA engaged/ neutral spine)
	  ○ Quadruped bird dog with variations
	  ○ Side-bridge
	• Hip strengthening
	  ○ Side-lying gluteus medius strengthening
	  ○ Quadruped hip extensor strengthening
	• Closed chain strengthening
	  ○ Standing side-step band walk
	  ○ Standing isometric squat with band proximal to knee
	  ○ Standing hip external rotation
	
	Cardio
	• Progress treadmill walking: time/speed
	• Progress stationary bicycle: cadence/resistance
	• Elliptical machine

Criteria to Progress	• Full spinal ROM
	  ○ Pain-free repeated lumbar flexion/extension x 10 reps without aberrant motion
	• No pain without brace for all activities, except sport/recreational exercise
	• MT activation without compensatory strategies
	  ○ Prone MT lift test: 10 reps x 10 sec hold
	• TA activation without compensatory strategies
	  ○ Prone pressure biofeedback test >10 seconds with 4 mm Hg drop
	  ○ Neutral trunk stabilization exercises: 10 reps x 10 sec hold
	• Side bridge activation without compensatory strategies

	○ Able to maintain test position for 80 seconds

PHASE III: ADVANCED STRENGTHENING (9-12 WEEKS), 4-6 PT visits

Rehabilitation Goals	• Address mobility/flexibility limitations • Progress trunk and lower quarter strength and endurance • Demonstrate lumbopelvic control with closed chain movement patterns • Progress cardiovascular endurance
Bracing/ Precautions	• Bracing may be discontinued if no pain with ADL
Additional Interventions *Continue with Phase I/II Interventions*	*Stability/Strength* • Front plank stabilization • Side plank stabilization • Anti-rotation trunk exercises • Supine curl up • Standing squat progression • Standing overhead press • Standing pull downs • Standing chest press *Neuromuscular re-education* • Proprioceptive training on dynamic surfaces • Spiral line chopping/lifting PNF diagonals • Begin plyometric exercise program *Cardio* • Progress treadmill walking: time/speed • Progress stationary bicycle: cadence/resistance • Progress elliptical machine: resistance/incline • Begin return to run program (if applicable)
Criteria to Progress	• Full uncompensated trunk active ROM in all planes • Pain-free end range of all lumbar motions • Prone DL raise>30 seconds • Supine DL lowering <70 degrees • No pain with initial phases of return to running program • Minimal to no pain or difficulty with integrated movements with load

PHASE IV: RETURN TO SPORT/RECREATIONAL EXERCISE (12 WEEKS+)

Rehabilitation Goals	• Maximize sport specific strength, endurance, and motor control, increasing intensity, volume, speed • Demonstrate lumbopelvic control with dynamic sports-specific activities • Establish proper training routine and independent management plan
Additional Interventions *Continue with Phase I/II/III Interventions*	*Stability/Strength* • Standing dead lift • Standing loaded carry *Cardio* Progress return to run program *Neuromuscular re-education* • Progress plyometric exercise program • Medicine ball toss progression • Reactive and perturbation training with dual task challenges *Education* • Monitor graded return to sport practice and competition/recreational exercise

Criteria to Discharge	• Proper mechanics during sports specific movement with full volume/intensity • Participate at pre-injury performance level without pain

01/2025

Contact	Please email MGHSportsPhysicalTherapy@partners.org with questions specific to this protocol

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